

# A second-person approach to other minds

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In a recent Review (The functional role of the parieto-frontal mirror circuit: interpretations and misinterpretations. *Nature Rev. Neurosci.* **11**, 264–274 (2010))<sup>1</sup>, Rizzolatti and Sinigaglia examine the role of the parieto-frontal cortex in action observation and action execution in monkeys and humans. They suggest that its functional relevance for cognition results from a 'mirror mechanism' that allows individuals to understand the actions of another individual by giving the observer a 'first-person grasp' of the motor goals and intentions of the other.

Although the Review seems to be well balanced by considering many of the recent arguments put forward against this simulationist interpretation of the evidence and by recognizing the relevance of other mechanisms<sup>2</sup>, it fails to make reference to the enactive account of cognition, which stresses that cognition is achieved by an animal's active exploration of and coupling with its environment<sup>3</sup>. This seems to be most relevant, as an extension of this account to the social domain suggests that social cognition is fundamentally different when an individual is actively and directly interacting with others. In such cases, an individual adopts a 'second-person perspective' in which interaction with the other can be thought of as essential or even constitutive for social cognition, rather than merely observing others and relying on a 'first- (or third-) person grasp' of their mental states<sup>4–6</sup>.

Apart from this being a conceptual 'blind spot' of the Review, the distinction of being directly engaged in a real-time interaction with someone else versus merely observing others also seems to be highly relevant to the discussion of the empirical evidence. The authors make reference to functional neuroimaging data that implicate two large-scale neural networks in understanding conspecifics' actions and intentions (the 'mirror neuron system' and the 'mentalizing network') and suggest that "there are currently no neurophysiological data that can explain how the 'mentalizing network' might work". This may be so, but it could also be argued that the existence of seemingly disparate sets of data is due to the inability of social neuroscience — paradoxically, but largely due to methodological constraints — to investigate real-time interactions between individuals in an ecologically valid way<sup>5</sup>. Therefore, it is unclear how activity in the parieto-frontal cortex and the mentalizing network during action observation may be modulated by the degree to which human observers perceive themselves as participants of an ongoing interaction and by exposure to social interaction. I therefore suggest that social neuroscience needs to make use of new experimental paradigms to systematically investigate this<sup>5</sup>.

In conclusion, Rizzolatti and Sinigaglia provide an authoritative review of the involvement of the parieto-frontal cortex in action observation and action execution.

However, they neglect recent conceptual and empirical developments that may have an important bearing on the interpretation of the relevant data. These developments suggest that future research should attempt to address how mechanisms that are perceived to exist in individuals might have to be re-assessed by taking social interaction seriously<sup>7–9</sup>. Such an attempt will help to shed light on the putatively complementary roles of mirror neurons and mentalizing networks as a function of direct engagement in real-time interaction and on aspects of cognition that might be unrelated to similarities between self-awareness and awareness of others in social interaction<sup>10</sup>.

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